

REMARKS

I. Status and Disposition of the Claims

Claims 1-3 are pending. Each of these claims have been amended to improve their clarity and to address concerns raised by the Examiner in the Office Action. Support for each of the above amendments may be found in the as-filed specification and claims, including, for example, original claims 1-3. Accordingly, these amendments raise no issue of new matter.

Claims 1 and 3 are objected to for various informalities. Office Action, page 2. Claim 2 is rejected under 35 U.S.C. §112, second paragraph. *Id.* Claims 1 and 2 are rejected under 35 U.S.C. §102 as anticipated by, or in the alternative, under 35 U.S.C. §103(a) as unpatentable over Japanese Patent Publication No. 2000-021402 ("Inoue"). *Id.* at 3. Applicants respectfully disagree with and traverse each of these objections and rejections for at least the following reasons.

II. Arguments

a. The claim objections are moot

The Examiner objects to claim 1 and 3 for the reasons set forth on page 2 of the Office Action. While Applicants do not necessarily agree with the Examiner's position, Applicants have amended claims 1 and 3 as indicated above. In view of these amendments, Applicants submit that the objections to claims 1 and 3 are moot, and should be withdrawn.

b. The §112, second paragraph rejection is moot

The Examiner rejects claim 2 under 35 U.S.C. §112, second paragraph as allegedly indefinite. *Id.* Specifically, the Examiner maintains that there is no antecedent

basis for the phrase, “the carbon amount” in original claim 2. In response, Applicants have amended claim 2 to clarify the claim language and to maintain strict antecedent basis. In view of this amendment, Applicants submit that the §112, second paragraph rejection is moot, and should be withdrawn.

c. The 35 U.S.C. §102(b)/103(a) rejection is improper

Claims 1-3 are rejected under 35 U.S.C. 102(b) as allegedly anticipated by, or in the alternative, as allegedly unpatentable over Inoue. *Id.* at 3-4. Applicants respectfully disagree with and traverse this rejection for at least the following reasons.

To establish a rejection under 35 U.S.C § 102, the Examiner must demonstrate that a reference teaches each and every element of a claim. See M.P.E.P § 2141. Indeed, a claim is anticipated under § 102 only if each and every element, as set forth in the claim, is found in a single prior art reference. M.P.E.P. §2131. Further, to establish a prima facie case of obviousness under 35 U.S.C. §103(a), the Examiner must show that three basic criteria have been met. See M.P.E.P. § 2143. Specifically, the Examiner must establish: (1) that the prior art teaches or suggests all of the claim limitations; (2) that there is some teaching or suggestion in the prior art to make the modification; and (3) that one of ordinary skill in the art would have had a reasonable expectation of success in making the asserted modification. *Id.* As discussed below, the applied §102(b) and 103(a) rejections are improper at least because the Examiner has failed to establish that Inoue teaches and/or suggests each and every element of claim 1. Further, the applied §103(a) rejection improper because Inoue provides no teaching or suggestion that would have motivated one of ordinary skill in the art at the

time the invention was made to modify the disclosure of the reference so as to arrive at the claimed invention.

Claim 1 recites, *inter alia*, "An active material...consisting essentially of a lithium-metal composite oxide [of the] general formula... $\text{Li}_x(\text{Ni}_{1-y}\text{Co}_y)_{1-z}\text{M}_z\text{O}_2$...wherein SO_4 ions are present in an amount ranging from 0.4 weight % to 2.5 weight %, and the occupancy rate of lithium found from the x-ray diffraction chart and using Rietveld analysis is 98% or greater." Claim 1. Claim 2 further recites that the active material of claim 1 contains carbon in an amount ranging from 0.12 weight % or less and has a Karl Fischer moisture content of 0.2 weight % or less. Claim 2.

According to the Examiner, Inoue discloses "an active material for a positive electrode constituting a secondary battery together with a negative electrode, a separator and a lithium salt containing nonaqueous electrolyte, and containing a sulfate radical preferably formed of an inorganic or organic sulfate of 0.1 to 5 weight % to the positive electrode." *Id.* at 3. Further, the Examiner asserts that "Inoue... discloses... a general formula for the positive active material: $\text{Li}_x\text{Ni}_y\text{Co}_{1-y-z}\text{M}_z\text{O}_2$, where M is at least one metal selected from Al, Mn, Ti, Fe, and Zn, and $0.1 \leq x \leq 1/05$, $0 \leq y \leq 0.9$ and $0 \leq z \leq 0.2$. *Id.* From this, the Examiner concludes that "[s]ince Inoue... discloses the same active material... as described above... [Inoue inherently discloses] a positive electrode having an occupancy rate of lithium... of 98% or greater...[a] carbon amount... of 0.12 wt% or less...[and a] Karl Fischer moisture content of 0.2 wt% or less when heated to 180°C..." *Id.* at 3. Applicants respectfully disagree with and traverse the Examiner's position for at least the following reasons.

i. Inoue does not inherently possess the claimed combination of lithium site occupancy rate and sulfate ion content.

Applicants submit that the Examiner has not met the burdens necessary to establish that Inoue inherently possesses the claimed combination of lithium site occupancy rate and sulfate ion content. In support of this argument, the Examiner is respectfully directed to MPEP § 2112 (IV), which states, *inter alia*: "[t]he fact that a certain result or characteristic **may** occur or be present in the prior art is **not** sufficient to establish the inherency of that result or characteristic." *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993). "To establish inherency, [the] **extrinsic evidence must** make clear that the missing descriptive matter is **necessarily** present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.

Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing **may** result from a given set of circumstances is **not** sufficient." *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (citations omitted) (internal quotations omitted)... Further even if, *arguendo*, the Examiner meets the burdens necessary to establish a prima facie argument of inherency, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. See *In re Best*, 562 F.2d 1252 at 1255 (C.C.P.A. 1977). As discussed below, the Examiner has not provided a sufficient basis in technical reasoning to establish that the lithium composite oxide of Inoue necessarily possesses the claimed lithium site occupancy rate, much less the claimed combination of lithium site occupancy rate and sulfate ion content.

Applicants note that to obtain the claimed lithium site occupancy rate, it is necessary to carefully control the manner in which a lithium composite oxide is

manufactured, e.g., as in the examples of the present specification. See Specification, pages 21-25. Inoue however, produces a lithium composite oxide in a significantly different manner from that of the claimed invention. Specifically, Inoue discloses a process for manufacturing a lithium composite oxide comprising: a) preparing a raw active material including a source of Li and M (where M is cobalt or nickel), b) adding sulfate radical to the raw active material and c) firing the resultant mixture. *Id.* In forming the raw active material, Inoue utilizes lithium carbonate as the source of lithium, and cobalt oxide or nickel oxide (which have a high content of sulfate radical) as the source of M. See Inoue, paragraph [0026]. These materials are placed in a crucible and fired to obtain LiCoO_2 (Examples 1-3) or $\text{LiCo}_{0.2}\text{Ni}_{0.8}\text{O}_2$ (Example 4).

In contrast, as disclosed in Example 1 of the present specification, the claimed lithium composite oxide is manufactured by: a) forming a composite nickel hydroxide via crystallization from a solution of nickel sulfate, ammonia, and caustic soda. Specification, pages 21-25. When needed, Co, Mn, and Al are co-precipitated so that the additive elements are mixed at close to the molecular level. *Id.* This composite nickel hydroxide is then combined with a commercial lithium hydroxide monohydrate powder and sintered in a controlled atmosphere. *Id.* As a result, a lithium composite oxide having a lithium site occupancy rate of 98% or greater is formed. *Id.*

Further, Applicants note that the present invention is directed towards providing a lithium metal composite oxide that allows a non-aqueous electrolyte secondary battery having high initial discharge capacity, low irreversible capacity, and good output characteristics at low temperature to be formed. Specification, page 9, lines 2-5. To achieve this object, the present invention controls **both** the lithium site occupancy rate

and sulfate ion content of the lithium composite oxide. In contrast, Inoue is directed towards the improvement of the cycle characteristics of lithium secondary batteries, and is completely silent with respect to the claimed combination of lithium site occupancy rate and sulfate ion content. See Inoue, paragraph [0003].

In view of the substantial differences between the manufacturing processes and end goals of Inoue and the claimed invention, Applicants submit that there is no basis in fact to support the Examiner's assertion that Inoue necessarily possesses the claimed lithium site occupancy rate. Applicants strongly emphasize that Inoue is silent with respect to the lithium site occupancy rate of the disclosed lithium composite oxide, and certainly does not teach or suggest the claimed lithium site occupancy rate. Moreover, there is no evidence of record that establishes that Inoue's process is even capable of producing a lithium composite oxide having the claimed lithium site occupancy rate. Indeed, other than a mere assertion that Inoue's lithium composite oxide is the same as that of the claimed invention, the Examiner has provided no additional basis in fact or technical reasoning to support this conclusion.

Thus, the Examiner's argument of inherency is supported by mere conjecture, not evidence or a basis in technical reasoning. At best, such reasoning supports an assertion that Inoue's process *might* result in the claimed lithium site occupancy rate. However, "[i]nherency **may not** be established by probabilities or possibilities. The mere fact that a certain thing **may** result from a given set of circumstances is **not** sufficient." *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (citations omitted) (internal quotations omitted).

For at least the foregoing reasons, Inoue fails to teach and/or suggest each and every element of claim 1 and 2. Accordingly, the §102(b)/103(a) rejection of these claims as anticipated by, or, in the alternative, as unpatentable over Inoue is improper, and should be withdrawn.

ii. There is no teaching or suggestion that would motivate one of ordinary skill in the art at the time the invention was made to modify Inoue so as to arrive at the claimed invention with a reasonable expectation of success.

In addition to the above, Applicants strongly emphasize that Inoue is silent with respect to at least the claimed lithium site occupancy rate. Accordingly, Inoue cannot be considered to provide any teaching or suggestion that would have motivated one of ordinary skill in the art at the time the invention was made to control the lithium site occupancy rate of the disclosed lithium composite oxide to within the claimed range. Moreover, the Examiner has not relied upon any additional art in support of the applied §103(a) rejection. Thus, for at least these additional reasons, the applied §103(a) rejection of claims 1 and 2 is improper, and should be withdrawn.

III. Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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